AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) A video segmentation system comprising:

a video source that provides a video sequence that includes a plurality of frames each including multiple pixels;

a frequency decomposer connected to said video source that generates a low frequency signature for each of said plurality of frames and a high frequency signature for each of said plurality of frames; ~~and~~

a cut detector connected to said video source and said frequency decomposer that identifies a cut transition between two adjacent frames using said low frequency signature; and

a fade detector that identifies a fade transition using said high frequency signature for a sequence of adjacent frames.

2. (Original) The video segmentation system of Claim 1 wherein said low frequency signature includes a first set of *x* by *y* coefficients.

3. (Original) The video segmentation system of Claim 1 wherein said video sequence is in a compressed format, wherein each of said frames includes a plurality of

blocks that include multiple pixels and wherein each of said blocks has a direct current (DC) luminance signal and an alternating current (AC) luminance signal.

4. (Original) The video segmentation system of Claim 1 wherein said frequency decomposer employs at least one of wavelet decomposition, discrete Fourier transformation (DFT), and discrete cosine transformation.

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5. (Original) The video segmentation system of Claim 4 wherein said frequency decomposition employs wavelet decomposition using a Haar transform.

6. (Original) The video segmentation system of Claim 2 wherein said cut detector includes:

a cut threshold generator that generates a cut threshold signal;

a difference signal generator connected to said frequency decomposer that generates a difference signal by comparing said first set of *x* by *y* coefficients for a first frame with said first set of *x* by *y* coefficients for a second frame that is adjacent said first frame; and

a comparator connected to said cut threshold generator and said difference signal generator that identifies a cut transition between said two adjacent frames if said difference signal exceeds said cut threshold signal.

7. (Original) The video segmentation system of Claim 1 wherein said difference signal generator applies a weighting function before calculating said differencing signal.

8. (Original) The video segmentation system of Claim 2 wherein said frequency decomposer generates a high frequency signature including a second set of x by y coefficients for each of said plurality of frames.

9. (Original) The video segmentation system of Claim 8 wherein said cut detector identifies first and second cut transitions.

10. (Original) The video segmentation system of Claim 9 further comprising:

a fade detector that identifies a fade transition using said high frequency signature for a sequence of adjacent frames of said video sequence that are located between said first and second cut transitions.

11. (Original) The video segmentation system of Claim 10 wherein said fade detector further includes:

a linear signal generator that assigns a fade threshold value for each of said frames that are located between said first and second cut transitions;

a summing signal generator that provides a sum signal for each of said frames located between said first and second cut transitions by adding said second set of *x* by *y* coefficients in said high frequency signature; and

a comparing circuit connected to said linear signal generator and said summing signal generator that compares said sum signal with said fade threshold value for each of said frames located between said first and second cut transitions and declares a fade transition when said sum signal and said fade threshold are approximately equal for each of said frames located between said first and second cut transitions.

12. (Original) The video segmentation system of Claim 11 wherein said linear function signal generator provides a decreasing linear signal to identify a fade out transition and an increasing linear signal to identify a fade in transition.

13. (Original) The video segmentation system of Claim 9 further comprising:

a dissolve detector that identifies a dissolve transition using said low frequency signature and said high frequency signatures for adjacent frames of said video sequence located between said first and second cut transitions.

14. (Original) The video segmentation system of Claim 13 wherein said dissolve detector includes:

a dissolve segments collector that identifies potential starting and end points of said dissolve transitions; and

a dissolve transition verifier that verifies said potential start and end points.

15. (Original) The video segmentation system of Claim 14 wherein said dissolve segments collector includes:

a summer that generates a sum signal based on said high frequency components;

a dissolve generator that generates a dissolve signal;

a difference generator that is connected to said summer and said dissolve generator and that generates a difference signal based on said sum signal and said dissolve signal; and

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a start and end identifier that is connected to said difference generator and that identifies said potential start and end points of said dissolve transition.

16. (Original) The video segmentation system of Claim 15 wherein said dissolve segments collector includes:

a smoothing filter that is connected between said summer and said difference generator.

17. (Original) The video segmentation system of Claim 16 wherein said dissolve transition verifier employs a double frame differencing algorithm on said potential start and end points.

18. (Withdrawn) A video retrieval system comprising:

a query image source;

a database containing a plurality of images;

a frequency decomposer connected to said video source and said query image source that generates low and high frequency signatures for said query image and said database images; and

an S-distance generator that generates an S-distance measurement for each of said database images.

19. (Withdrawn) The video retrieval system of claim 18 wherein said S-distance generator compares said low and high frequency signals of said query image and said database image to generate said S-distance measurement.

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20. (Withdrawn) The video retrieval system of claim 19 wherein said database images are returned in order of highest to lowest similarity based on said S-distance measurement.

21. (New) A video segmentation system comprising:

a video source that provides a video sequence that includes a plurality of frames each including multiple pixels;

a frequency decomposer connected to said video source that generates a low frequency signature for each of said plurality of frames; and

a cut detector connected to said video source and said frequency decomposer that identifies a cut transition between two adjacent frames using said low frequency signature,

wherein said frequency decomposition employs wavelet decomposition using a Haar transform.

22. (New) A video segmentation system comprising:

a video source that provides a video sequence that includes a plurality of frames each including multiple pixels;

a frequency decomposer connected to said video source that generates a low frequency signature for each of said plurality of frames;

a cut detector connected to said video source and said frequency decomposer that identifies a cut transition between two adjacent frames using said low frequency signature;

a fade detector that identifies a fade transition using said high frequency signature for a sequence of adjacent frames of said video sequence that are located between said first and second cut transitions;

a linear signal generator that assigns a fade threshold value for each of said frames that are located between said first and second cut transitions;

a summing signal generator that provides a sum signal for each of said frames located between said first and second cut transitions by adding said second set of *x* by *y* coefficients in said high frequency signature; and

a comparing circuit connected to said linear signal generator and said summing signal generator that compares said sum signal with said fade threshold value for each of said frames located between said first and second cut transitions and declares a fade

transition when said sum signal and said fade threshold are approximately equal for each of said frames located between said first and second cut transitions.